

MULTIMEDIA MULTIPLEXING METHOD

Background of the Invention

The present invention relates to a multiplexing method for multimedia communication, and more particularly, to a multiplexing method compatible with the H.223 protocol by changing a header of a multiplex-protocol data unit (MUX-PDU).

In general, the H.324 recommendation prescribes a multiplexing of video and audio signals which is effective in an error-prone channel such as a wireless channel, and includes H.223 multiplexing, H.245 controlling, H.263 video CODEC and G.723.1 audio CODEC. Also, H.223 multiplexing is recommended as a method for multiplexing video, audio and other data in protocol data units (PDU) in order to realize a video telephone and video conferencing in a total digital telecommunication network by the ITU-T (the telecommunication standardization sector of the International Telecommunication Union). Also, the H.324 recommendation includes Mode 1 having high complexity and Mode 3 without having complexity. According to the Mode 1, while generating a variable length packet an unequal error protection (UEP) is performed by adopting a rate compatible punctured convolutional (RCPC) encoder/decoder (CODEC) in an adaptation layer which is an upper layer. Also, an automatic request for retransmission (ARQ) is used to maintain the overall quality of service (QOS) even though the channel throughput decreases. However, the Mode 1 has a high complexity at a portion of RCPC CODEC, which

increases the complexity of the overall system. Thus, it is difficult to implement a real-time process. Also, the total channel throughput of the system may decrease rapidly since it adopts a retransmission method. For example, the channel throughput is 50% or less when the retransmission is performed one time, and 33% or less when the retransmission is performed twice. Thus, it is difficult in Mode 1 of the H.324 to implement transcoding having compatibility with the conventional H.223. Meanwhile, Mode 3 has virtually no error-protection concept, so that error-resiliency in an error-prone channel is very low.

Summary of the Invention

It is an object of the present invention to provide a multiplexing method for multimedia communication, enabling transcoding with the H.223 protocol by adding a flag which is similar to a pseudo noise code (PN CODE), after a high-level data link control (HDLC) flag in the multiplex-protocol data unit (MUX-PDU) by the H.223 protocol.

To achieve the object, there is provided a multiplexing method for multimedia communication in the H.223 protocol, comprising the steps of: (a) encoding media data; and (b) multiplexing the media data encoded in the step (a) in units of a predetermined frame, and inserting a second flag having a predetermined length with an auto-correlation in the frame after a first flag having the opening and closing of the frame.

Preferably, the second flag of the step (b) has a bit

pattern of "10110010".

Brief Description of the Drawings

The above object and advantages of the present invention will become more apparent by describing in detail a preferred embodiment thereof with reference to the attached drawings in which:

FIG. 1 is a schematic block diagram of a device for implementing a multiplexing method for multimedia communication, compatible with the H.223 protocol, according to the present invention;

FIG. 2A is a diagram showing the structure of a general H.223 MUX-PDU frame; and

FIG. 2B is a diagram showing the structure of an H.223 MUX-PDU frame according to the present invention;

FIG. 3A is a diagram showing the structure of the H.223 MUX-PUD frame in a filling mode; and

FIG. 3B is a diagram showing the structure of the H.223 MUX-PUD frame in an abort message mode.

Detailed Description of the Invention

In FIG. 1 showing a device for implementing an H.223 multiplexing method for multimedia communication according to the present invention, a multiplexing portion 130 includes an H.223 protocol unit 110 and a transcoder 120. The H.223 protocol unit 110 and the transcoder 120 performs multiplexing with respect to encoded media data (video, audio and other data), passing through protocol data units (not shown) to

transmit to a channel.

FIG. 2 is a diagram showing the structure of a general H.223 MUX-PUD frame.

As shown in FIG. 2A, the H.223 MUX-PDU is constituted by units of a frame, and the frame includes a high-level data link control (HDLC) flag 110 for transmission control, a header 120 including data information, and a payload 130 including video and audio data.

All MUX-PDU of the H.223 are defined using the HDLC flag 110 of FIG. 2A. The HDLC flag 110 has an unique bit pattern "01111110" having six continuous "1s" representing the opening or closing of the frame, and is used for synchronization of the frame.

FIG. 2B is a diagram showing the structure of an H.223 MUX-PDU frame according to the present invention. The MUX-PUD frame includes an HDLC flag 140, an extra flag 150, a header 160 and a payload 170. The transcoder 120 inserts an 8-bit extra flag 150 which is similar to a pseudo noise code (PN CODE) having a high auto-correlation next to the HDLC flag 150 as shown in FIG. 2B. Here, the reason for selecting the extra flag having a bit pattern of "10110010" is due to its high auto-correlation as the PN CODE does. Thus, only the bit pattern of "10110010" may be added as the extra flag 150, or other bit streams having a high auto-correlation may be used thereas to increase error-resiliency. Also, a longer flag may be added in consideration of a trade-off with a channel band width. Preferably, adding the extra flag, suggested by the present invention is used, is prevented in a filling mode in

which HDLC flags exist continuously as shown in FIG. 3A or an abort message mode without having a payload as shown in FIG. 3B.

The multiplexing method for multimedia communication according to the present invention is not limited to the particular forms illustrated and further modifications and alterations will occur to those skilled in the art. That is, interleaving and RCPC processes may be performed by using each extra flag of a plurality of MUX-PDUs.

As described above, in the multiplexing method for multimedia communication according to the present invention, MUX-PDU including an extra flag having a high auto-correlation is transmitted in the H.223 protocol, increasing the probability of detecting the MUX-PDU by a receiver. Thus, error-resiliency is also increased. Also, when the multiplexing method is used together with the RCPC and interleaving methods, error-resiliency can be further increased.